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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/991,915	11/26/2001	Hideki Komatsuda	07553.0027	7548

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EXAMINER	
PALADINI, ALBERT WILLIAM	
ART UNIT	**PAPER NUMBER**
2125	

DATE MAILED: 03/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/991,915	KOMATSUDA, HIDEKI	
	Examiner	Art Unit	
	Albert W Paladini	2125	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 November 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *11/26/01*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

2. Claims 1-22 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In the second paragraph on page 9, it states "its optical wavefront aberration is determined through an arithmetic operation by calculating the optical wavefront (S10). The definition of wavefront in the New Webster's World Dictionary (1974) is given below:

Wavefront: a surface, at right angles to a propagated disturbance, that passes at any given moment through those parts of the wave motion that are in the same phase.

Considering this well-known definition of wavefront, it is not understood what is calculated in step S10. A wavefront is a surface perpendicular to the moving wave. The specific parameters to be calculated must be described in the specification. If this means determining the position of the moving front at a point in time, then specific methods of measurement for determining the optical rays, and the relative phases of the

optical rays must be provided. On page 9, it also states "the wavefront aberration of the optical system is determined through an arithmetic operation by calculating the optical wavefront (S20). In optical systems, there are numerous types of aberrations such as coma, chromatic aberration, spherical aberration, etc. In addition to explaining what calculating the wavefront means, the specification must describe what the specific aberrations is, how the optical system causes the aberration, and how it is calculated. Calculating an optical wavefront has no meaning. If the presence of a film, or data on the film somehow causes an aberration, noise, or a disturbance to an optical system, the specification must provide specific system details and explain precisely how the film affects transmission of light through the optics. The type of "aberration" must be clearly explained as the attached references do.

Appropriate correction and clarification are required.

3. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

4. Claims 1-7, and 21 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1

Line 5 recites, "a third step for calculating an optical wavefront of said optical system." A surface perpendicular to a group of traveling light rays which are in the same direction and phase is called a wavefront. It is not understood what calculating a wavefront means. If some specific parameters, which characterize the wavefront, are to be calculated, this must be recited, so that it is understood what calculating a wavefront means. Not only must the specific parameters be recited, but also the method of measuring or performing this calculation must be explained in order for it to make sense. The claim recites, "preparing a data on the film" and "preparing a data on said optical system". There is no explanation of what kind of data is prepared on the film. If the film is a coating for a substrate, it is not understood what type of data would be relevant. "Preparing a data on said optical system" is not understood. If an optical system consists of elements such as lenses, mirrors, light sources, interferometers, etc., where and how would data be prepared? The terminology is also singular, as it recites "a data." It is not understood what is meant by "a data."

Claim 7

Lines 3-4 recite "a first step for calculating an optical wavefront of said image-forming optical system". A surface perpendicular to a group of traveling light rays which are in the same direction and phase is called a wavefront. It is not understood what calculating a wavefront means. If some specific parameters, which characterize the

wavefront, are to be calculated, this must be recited, so that it is understood what calculating a wavefront means. Not only must the specific parameters be recited, but also the method of measuring or performing this calculation must be explained in order for it to make sense.

Claim 21

Lines 5-6 recite "a first step for calculating an optical wavefront of said image-forming optical system". A surface perpendicular to a group of traveling light rays which are in the same direction and phase is called a wavefront. It is not understood what calculating a wavefront means. If some specific parameters, which characterize the wavefront, are to be calculated, this must be recited, so that it is understood what calculating a wavefront means. Not only must the specific parameters be recited, but also the method of measuring or performing this calculation must be explained in order for it to make sense.

Appropriate correction and clarification are required.

5. Claims 8-20 and 22 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements and structural cooperative relationships of elements, such omission amounting to a gap between the necessary elements and structural connections. See MPEP § 2172.01.

Claim 8

The claim basically recited an objective of having less aberration in an optical system. The claim does not recite the elements, which constitute the system that can achieve the objective of having less aberration. The phrase "wavefront aberration" must also be clearly defined. A surface perpendicular to a group of traveling light rays which are in the same direction and phase is called a wavefront. It is not understood what "wavefront aberration" means. If some specific parameters, which characterize the wavefront aberration, are to be calculated, this must be recited. The wavefront aberration is not defined, and there are no elements, which measure this undefined characteristic, and no elements to perform any sort of a calculation.

Claim 22

Lines 1 recites "a computer receivable carrier wave". A "carrier wave" is an electromagnetic wave, which can be modulated in frequency, amplitude, or phase to transmit speech, music, images, or signals. This is not an element of an invention. The Applicant may want to recite the specific circuit elements, which create the carrier wave. An electromagnetic wave is not statutory subject matter. If a program is being transmitted by the carrier wave, the elements, which generate the carrier wave, and the elements, which create the program, might be recited. Line 5 recites "a first step for calculating an optical wavefront". A surface perpendicular to a group of traveling light rays which are in the same direction and phase is called a wavefront. It is not

understood what calculating a wavefront means. If some specific parameters, which characterize the wavefront, are to be calculated, this must be recited, so that it is understood what calculating a wavefront means. Not only must the specific parameters be recited, but also the method of measuring or performing this calculation must be explained in order for it to make sense.

Appropriate correction and clarification are required.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Kikuchi (6077349).

This rejection is made to the extent that claims are understood by considering the recited objectives and addressing the elements which appear to be consistent with the objective.

Kikuchi discloses a method a method and apparatus for manufacturing a disc shaped recording medium by applying a coating film. He calculates the wavefront aberration in micrometers by equation 1 which considers the refractive index of the film, the laser wavelength of the optical system, the numerical aperture of an objective lens,

and the thickness error of the film. The calculation shows the difference in aberration with and without the film.

Relevant Prior Art

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Kamon (6245470) discloses a projection aligner which includes a transparent substrate, on at least one principal plane of which a transparent multi-layer film for regulating a wavefront is formed, can be used as the aberration eliminating filter used in the projection aligner of the first Embodiment of the projection alignment.. The transparent multi-film has a film thickness distribution, by which the wavefront shift occurring due to the aberration of a projection optical system can be compensated for.

Ichihara (6312373) discloses a method of manufacturing a projection optical system using a detector arranged on the exit side of pinhole plate. Interference fringes are formed on the detector due to interference between the ideal spherical wavefront from aperture and the transmitted wavefront from semitransparent film. The transmitted wavefront from semitransparent film F corresponds in shape to the wavefront aberration of the optical system. The interference fringes on the detector assume a shape corresponding to the deviation of this transmitted wavefront from an ideal spherical wavefront . Accordingly, the wavefront aberration of the optical system can be determined by analyzing, in a computer CU electrically connected to detector, the interference fringes detected by detector.

Nishiyama (6580674) discloses a phase shifter in an optical system which includes a transparent substrate having a wavefront aberration correcting function comprises a glass substrate or the like, and it functions by forming a groove directly or in the thin film formed on a surface of the transparent substrate in the first region wherein the groove has a two-dimensionally distributed depth depending on a quantity of aberration to be corrected so that a distribution of phase difference is produced spatially. The system also offers the possibility of forming simultaneously in the same surface of the same transparent substrate a groove for producing a wavefront aberration correcting function and a periodical concave/convex-like diffraction grating for producing an aperture controlling function. In this case, it is possible to simplify steps for processing.

9. Any inquiry concerning this communication or earlier communication from the examiner should be direct to Albert W. Paladini whose telephone number is (571) 272-3748. The examiner can normally be reached from 7:30 to 3:30 PM on Monday, Tuesday, Thursday, and Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Leo P. Picard, can be reached on (571) 272-3749. The official fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Albert W. Paladini
Primary Examiner
Art Unit 2125

February 25, 2005